ADDENDUM

In r DOTY Attorney Docket SD8342

"Marked Version Showing Changes Made to the SPECIFICATION"

ON PAGE 1, IN THE PARAGRAPH BEGINNING AT LINE 18 THE AMENDED CHANGES ARE SHOWN BELOW

Generally, [~~semiconductor~~] electronic detectors of nuclear radiation operate by exploiting the fact that incident radiation, by interaction in the detector volume, will create a charge pulse consisting of holes and electrons that can be separated under the influence of an electric field and the current detected by an external circuit. The conversion efficiency of solid state detectors is typically 100 to 1000 times greater than that of conventional gas-filled tubes consequently, solid state detectors are more sensitive than conventional gas-filled tubes. Moreover, solid state detectors are generally more compact, robust, and reliable than their gas-filled counterparts.

ON PAGE 4, IN THE PARAGRAPH BEGINNING AT LINE 2 THE AMENDED CHANGES ARE SHOWN BELOW

The result of neutron interaction described above is a detectable current pulse. In the invention, the ionizable medium is hexagonal boron nitride (hBN), and preferably pyrolytic hexagonal boron nitride. The material of the present invention may be a single crystal, or it may be disordered. For example, the material may be a polycrystalline aggregate or a layered structure, refer to as "[~~turbostatic~~] turbostratic," which exhibits long range crystallographic order in that the hexagonal crystallographic *c* axis in each layer is generally aligned in a common direction. Current pulses produced by conversion of the incident neutrons to energetic charged particles are detected by

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applying an electric field to the <u>body</u> of the hBN detector [~~body~~] in a direction about perpendicular to the crystallographic *c* axis.

ON PAGE 6, IN THE PARAGRAPH BEGINNING AT LINE 5 THE AMENDED CHANGES ARE SHOWN BELOW

Additional testing was done with 3.4 MeV protons (^1H) from an accelerator. When these protons were directed on the device of FIG. 3, no detectable signal was produced. In consideration of the above results, it is clear that [~~the~~] both the energy deposited (E) and the rate of energy deposition (dE/dx) are important in generating a signal in the device of the invention. Therefore, the insensitivity to gamma radiation from the nuclear reactor is due not only to the low atomic numbers of the constituents of the hBN, but to the existence of a dE/dx threshold. This threshold is between the maximum dE/dx for a proton (^1H) and that of an alpha particle (^4He). The lower bound for this threshold is about 12 eV/Angstrom, and is indicated as a horizontal line in FIG. 2.
